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IN THE

Supreme Court of the United States

OCTOBER TERM 1974

No. 74-1033

C. MARSHALL DANN, COMMISSIONER OF PATENTS & TRADEMARKS,

Petitioner,

v.

THOMAS R. JOHNSTON,

Respondent.

On Writ of Certiorari to the United States Court of Customs and Patent Appeals

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MOTION FOR LEAVE TO FILE BRIEF AMICUS CURIAE AND BRIEF AMICUS CURIAE FOR THE COMPUTER & BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION (CBEMA)

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MOTION FOR LEAVE TO FILE BRIEF AMICUS CURIAE

The Computer & Business Equipment Manufacturers Association (CBEMA) respectfully moves for leave to file the attached Brief Amicus Curiae in the above-entitled case. Petitioner has consented to the filing of this brief. The consent of respondent was requested but refused.

This Court granted CBEMA's motion for leave to file a brief as Amicus Curiae in support of the Petition for the granted Writ of Certiorari in this case.

CBEMA is the trade association which, along with its predecessor association, the Business Equipment Manufacturers Association, has represented the computer and business equipment industry for the past 59 years. The companies comprising the current CBEMA membership include the nation's leading manufacturers of computers, business equipment and related products. While product lines of member companies vary widely, the following list is illustrative: electronic computers, computer software including programs, computer input and output devices, computer storage devices, support services, data transmission equipment, optical character readers, addressing machines, accounting machines, bookkeeping machines, mail handling equipment, duplicating machines and office copying machines. CBEMA is also the approved sponsor under the American National Standards Institute (formerly the American Standards Association) for the establishment of domestic and international standards related to information processing, computers and office machines.

Members of CBEMA have consistently been leaders in achieving major developments, in both the concept and application, of computer programming and data processing, and have contributed greatly to the present significant status and role of the computer in modern society. These members maintain and support extensive activities devoted to applied research and systems development in all phases of computer use and data processing.

Not only is the subject matter of the present suit of vital concern to manufacturers in the computer and data processing field, it is also of vital concern to the Government and to the public generally. The resolution of the issues squarely presented in this case will affect the development of the data processing industry in the United States and will have an impact on those segments of our society which use and receive the benefits of technological advances in this industry.

CBEMA believes that, because of its extensive background in computer hardware and software, it is in a position to present a unique point of view not likely to be covered by the Solicitor General.

Accordingly, CBEMA respectfully requests that this Court grant leave to file the attached Brief Amicus Curiae.

Respectfully submitted,

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BRIEF AMICUS CURIAE FOR THE COMPUTER & BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION (CBEMA)

I

QUESTIONS PRESENTED

1. Whether subject matter which is not patentable under 35 U.S.C. § 101 becomes patentable if a general purpose computer is programmed to perform the non-patentable subject matter.

2. Whether an existing general purpose computer programmed to perform a financial accounting procedure comprises patentable subject matter under 35 U.S.C. § 101 when claimed as a "machine system".

II

INTEREST OF THE COMPUTER & BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION

This brief Amicus Curiae is submitted by the Computer & Business Equipment Manufacturers Association (CBEMA) in accordance with Rule 42(2) of this Court. Petitioner has consented to the filing of this brief. The consent of respondent was requested but refused.

This Court granted CBEMA's motion for leave to file a brief as Amicus Curiae in support of the Petition for the granted Writ of Certiorari.

CBEMA is the trade association which, along with its predecessor association, the Business Equipment Manufacturers Association, has represented the computer and business equipment industry for the past 59 years. The companies comprising the current CBEMA membership include the nation's leading manufacturers of computers, business equipment and computer-related products. While product lines of member companies vary widely, the following list is illustrative: electronic computers, computer software including programs, computer input and output devices, computer storage devices, support services, data transmission equipment, optical character readers, addressing machines, accounting machines, bookkeeping machines, mail handling equipment, duplicating machines and office copying machines. CBEMA is also the approved sponsor under the American National Standards Institute (formerly the American Standards Association) for the establishment of domestic and international standards relating to information processing, computers and office machines.

Members of CBEMA have consistently been leaders in achieving major developments, in both the concept and application, of computer programming and data processing, and have contributed greatly to the present significant status and role of the computer in modern society. These members maintain and support extensive activities devoted to applied research and systems development in all phases of computer use and data processing.

CBEMA does not have any direct or indirect interest in the *Johnston* patent application. As Amicus Curiae herein, CBEMA has a deep interest in the proper resolution of the legal questions raised in this case and the profound impact of this decision will have upon the data processing industry and the public it serves.

Not only is the subject matter of the present case of vital concern to manufacturers in the computer and data processing field, it is also of vital concern to users of computer equipment, including the Government, and the public generally. The resolution of the issues presented in this case will affect the development of the data processing industry in the United States and will have an impact on those segments of our society which use and receive the benefits of technological advances in the industry.

This brief outlines the difficulties and uncertainties in the development and use of computer programs which will follow if the Lower Court's decision is affirmed, as well as the social, economic and practical implications of any holding that computer programs of the type sought to be patented in this case are patentable subject matter. It is CBEMA's position that the majority of the Lower Court misconstrued this Court's holding in *Gottschalk* v. *Benson*[1] concerning patentable subject matter.

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[1] 409 U.S. 63 (1972).

III

THE NATURE OF THE COMPUTER AND COMPUTER PROGRAMS

The computer enhances and extends man's problem solving capacity by providing more powerful methods for calculating, storing, organizing, structuring, retrieving and manipulating large amounts of information in the form of data. Fundamentally, the computer expands the ability of man to use his intellectual capacity.

A general purpose digital computer may be described in the following manner. The machine has input and output units which accept and deliver data; a memory which holds or keeps data in addressable locations; a computer unit which performs various arithmetic and logical operations upon the data; and a control unit which controls the operations and coordinates the activities of the other units. A program of instructions for operating the computer is stored in the memory and during operation of the computer directs the control unit to cause the various other units to perform their operation in a designated sequence to obtain a useful result. The data or instructions are manifested in these various units by electrical pulses or states. Each of these units contains devices for manipulating or handling the electronic pulses.[2]

Although a computer is capable of handling a large variety of problems, the number of basic operations it can perform (adding, subtracting, multiplying, dividing, comparing, shifting, storing and the like) is limited.

[2] For a general discussion of how a computer operates, *see* "Protecting Proprietary Rights of Computer Programs: The Need for New Legislative Protection," 21 The Catholic Univ. L. Rev. 181 (Fall 1971).

Every computer can operate solely in accordance with the directions it is given. These directions are contained in computer programs and instruct the computer how it should manipulate and compare data in accordance with an algorithm, which is simply a step-by-step procedure for accomplishing a desired result. For example, the algorithm may be a mathematical formula, a method of doing business, or an expression of a scientific principle or law of nature.

A computer program is a set of instructions to a computer as to how it should manipulate data.[3] The computer program may direct something as simple as adding two plus two, or as complex as determining the proper course for a manned flight to the moon. In solving such problems, the computer can only function in accordance with the algorithm used by the programmer for solving the problem.

A computer program is created in the following manner: A programmer first develops an algorithm which sets forth in broad terms the desired mathematical principles or logical sequences to be used in solving the problem.[4] The next step in the process is the development

[3] A computer program is often described as either a "systems" or "applications" program. A systems program is normally developed by the computer manufacturer. It is designed as an integral part of the computer and functions in a housekeeping capacity for the many specific types of jobs to be performed. On the other hand, an applications program merely utilizes an existing computer as a tool to solve a particular problem. An applications program does not give rise to new system functionality or result in changes in the computer provided by the manufacturer. A large number of applications programs are developed by the various computer users. Respondent's program is a prime example of an applications program because it is addressed to solving a problem external to the computer system where the computer is simply being used as a tool to perform the financial banking algorithm sought to be patented.

[4] An algorithm is often expressed in a written flow chart, which is not hardware. See Figures 1A through 9C of the *Johnston* patent application. (Pages 277-291 of the record below).

of a detailed set of instructions which the computer follows in carrying out the algorithm. This set of instructions is a computer program. In devising the algorithm and in preparing the program it is not necessary to be knowledgeable about the computer's internal workings or how it actually handles and manipulates the data received. Given a particular algorithm, the programmer takes the limited number of fixed operations which a computer is capable of carrying out and arranges these operations in a sequence so that the desired algorithm is implemented. Once the algorithm has been established, any programmer can program a general purpose computer to perform the steps of the algorithm.[5]

An appropriate analogy is often considered to be found in the way in which a player piano operates. The piano has a mechanism for automatically operating its keys according to the instructions contained in a punched paper piano roll. A given musical composition can be automatically played on the piano by simply punching holes in the piano roll so that the keys will play the musical notes called for by the composition. The piano and its control mechanism are designed in such a way that it is able to perform any musical composition whose notes are recorded in the piano roll.

The algorithm upon which a computer program is based is the equivalent of the musical composition in the player piano analogy, and the series of machine instructions used to implement the algorithm in a computer program are analogous to the instructions punched into the paper piano roll. In both instances, the second step amounts to nothing more than a set of instructions for the machine (*i.e.*, computer or piano) automatically to implement the steps contained in the algorithm or musical composition. Such creativity as exists lies solely in the development of the algorithm or musical composition, and any patent issuing thereon would necessarily be grounded on the algorithm or musical composition.

[5] *See* discussion of basic elements of computer programming in Breyer, "The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs," 84 Harv. L. Rev. 281, 340-51 (1970).

Respondent advocates that a computer is a warehouse of unrelated parts and that a program applied to such a computer creates instant hardware from these unrelated parts which may be claimed as a machine system. A computer is not a warehouse of unrelated parts, any more than is a player piano. This warehouse-of-unrelated-parts concept finds no basis in fact and is strictly a vehicle to support the patenting of non-patentable subject matter.[6]

IV

ARGUMENT

A. The Holding By The Lower Court Conflicts With This Court's Holding In *Gottschalk* v. *Benson*

In *Gottschalk* v. *Benson*,[7] this Court held that a mathematical process for converting binary-coded-decimal numerals into pure binary numerals, which had been embodied in a computer program for use in a general purpose digital computer, was not a patentable process within the meaning of 35 U.S.C. § 100(b). By so holding, this Court explicitly recognized that granting patent protection to the computer programming process would, in effect, provide such protection to the algorithm itself. Thus, the Court looked to the substance of the claimed

[6] The United States Patent & Trademark Office has granted patents on computers and player pianos as machine combinations which would not have been granted if, in fact, they were only a "warehouse of unrelated parts."

[7] 409 U.S. 63 (1972).

invention—a mathematical algorithm—and determined that the contribution was non-patentable subject matter under the patent laws.

In the decision below in this case, the Court of Customs and Patent Appeals held that a general purpose computer programmed with a financial banking procedure and claimed as a new "machine system" is patentable subject matter under 35 U.S.C. § 101.[8] That holding focuses on the form of the claims presented to the Court, however, and does not look, as did this Court's holding in *Gottschalk* v. *Benson*, to the substance of the alleged contribution. Respondent has not devised a new "machine system" in the sense of combining hardware elements. A review of the record shows that no machine has been invented in this case or disclosed in respondent's patent application[9] and that respondent's real contribution is a financial banking algorithm implemented on a general purpose computer. This is conceded by respondent, who admitted in his brief before the Court of Customs and Patent Appeals that "the invention is being sold as a program to banks" and was "reduced to practice in the software form of computer programs. . . . ."[10]

Financial banking procedures are methods of doing business which, like mathematics, plans of action, scientific principles, ideas, laws of nature, etc., historically have been considered non-patentable as a matter of public policy. Thus, even if respondent had disclosed a hardware implementation for his non-patentable algorithm,

[8] The Lower Court's Opinion is reported at 502 F.2d 765 (C.C.P.A. 1974).

[9] For example, the so-called "control system" disclosed in respondent's patent application is not hardware but simply applications program routines for manipulating bank account data.

[10] *See* page 18 of respondent's brief before the C.C.P.A. and Judge Rich's dissent, 502 F.2d at 773.

it should not be patentable if claimed so broadly as to provide patent protection for the algorithm. Unless this Court holds respondent's application program unpatentable, it would be possible simply to disclose an obvious hardware implementation for the algorithm, such as a general purpose computer, as a basis for effectively obtaining patent protection for the algorithm.

This Court should not sanction any procedure for patenting non-patentable subject matter. Thus, where a computer program is predicated upon a non-patentable algorithm, the program should not be patentable as a "machine system" even if it coacts "synergistically" with the computer.[11] In the instant case, however, the Court need not address the concept of synergism since none exists. The computer is simply being used as a tool to perform the financial banking algorithm developed by respondent.

The holding below has created an improper extension of the patent system by providing patent protection (1) for a non-patentable algorithm, (2) implemented as a computer program, (3) for use in a general purpose computer, and (4) claimed as a "machine system". Thus, the Lower Court has explicitly approved a procedure to patent indirectly subject matter which could not be patented directly.[12]

If semantic distinctions are set aside for purposes of determining whether the claimed inventions are drawn to patentable subject matter, the "machine system" in the instant case is in the same category as the mathematical "process" in *Gottschalk* v. *Benson*. In both cases,

[11] This is a requirement for patentable combinations established by this Court. *See Andersons-Black Rock* v. *Pavement Salvage Co.*, 396 U.S. 57 (1969).

[12] *See* this Court's recognition of the admonition by the President's Commission on the patent system regarding patenting indirectly subject matter which could not be patented directly. 409 U.S. at 72.

they are simply computer programs for performing algorithms, which are not patentable subject matter. This was recognized in the dissent below, where it was observed that every competent patent draftsman can write process claims in machine system form.[13]

The determination whether the disclosed invention constitutes patentable subject matter must be made by examining the *substance* of the discovery, rather than the *form* in which it is claimed. The patentability of respondent's claims must be judged in the light of his actual contribution—a financial banking algorithm embodied in a program for a general purpose computer. When the substance of the invention is considered, the result of the Lower Court's decision conflicts with this Court's holding in *Gottschalk* v. *Benson*.[14]

B. Policy Considerations Opposed To The Availability Of Patents For Computer Programs Of The Type Contained In This Case

1. *The Computer Industry Has Developed In An Atmosphere Of Free Interchange Of Computer Programs*

In two decades the computer industry has become a major and substantial factor in our economy and now impacts virtually all segments of society. When computers were first used commercially less than twenty-five

[13] 502 F.2d at 773.

[14] This Court found claims in product form improper because they, in effect, covered non-patentable subject matter in *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127 (1948). *See also O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62 (1853); *Armour Pharmaceutical Co.* v. *Richardson-Merrell, Inc.*, 396 F.2d 70 (3d Cir. 1968); *Davison Chemical Corp.* v. *Joliet Chemicals, Inc.*, 179 F.2d 793 (7th Cir. 1950); *Templeton Patents, Ltd.* v. *J. R. Simplot Co.*, 336 F.2d 261 (9th Cir. 1964). Substantively, respondent relies on non-patentable algorithmic functions in the claims to support patentability of components found in every general purpose computer. The effect is to claim the algorithm.

years ago, a number of respected businessmen, scientists and public officials believed that the ultimate need for such highly sophisticated devices would be limited to a few dozen systems. In fact, the uses and applications of computers have increased beyond the most extravagant earlier projections, and by 1974, over 255,000 computer systems made by American-based companies were reported to be in use, with a cumulative value of $54.1 billion.[15] This rapid growth will continue over the next few years and it has been estimated reliably that by 1979, there will be over 886,000 American-made computer systems in use with a value in excess of $99.7 billion.[16]

In the so-called programming and software side of the industry, computer users are already spending as much on software as they are on computer hardware, and the software field has itself become a multi-billion dollar subindustry.[17] The growth rate of the software field is expected to increase significantly and in less than five years

[15] EDP Industry Report, April 30, 1975, Vol. 10, Nos. 15 and 16 at p. 9. These figures are for worldwide use of computers made by American companies. In the United States alone, the cumulative value of computer systems in use in 1974 is estimated at $33.6 billion and by 1979 this figure is projected at $60.2 billion.

[16] *Id.* at p. 9. This report also states on page 1 that in 1974, total worldwide shipments for American-based companies of computers was $11.2 billion and that by 1979 total revenue will be $18.9 billion.

[17] To select an arbitrary point in time to illustrate the growth factor, in 1957 the Association for Computing Machinery had approximately 3,000 members which represented the vast majority of the working computer programmers in the United States. Some fifteen years later in 1972, it was estimated that the number of employed programmers exceeded 250,000 and by 1985 it has been estimated that there will be in excess of 640,000 working programmers. *See Expanding Use of Computers In The 70's, Markets-Needs-Technology*, 51 (Prentice Hall 1971); "Carlson Testifies on Programmer-Professional or Not," 14 Communications of the ACM 201 (March 1971), S.S.D. No. 249 S.I.L.T. Presentation at Share Meeting XLIII, p. 25 (October 15, 1974); U.S. Gov. Occupational Outlook Handbook, 1972-73 edition and 1973-1974 edition.

computer users will be spending at least twice as much on software as on computer hardware.[18] For example, it has also been estimated reliably that the gross value of software purchased and supplied in the United States in 1970 was approximately $5 billion, that in 1975 this figure should double to $10 billion, and that by 1980, it will triple to $15 billion.[19]

The tremendous growth of the computer software industry and the vast number of breakthroughs in the field of programming, which have occurred in the last two decades, have by and large taken place in a legal framework conducive to the free interchange of ideas and information. Industry experience shows that new algorithms and programming procedures, as well as specific programs, have been widely disseminated and generally exchanged. This atmosphere of intellectual freedom has contributed significantly to the enormous strides made in the use of computers.

Wide dissemination of computer programs has benefited the users of computers and the public at large. For years professional journals have published algorithms and pertinent discoveries in mathematics in order to encourage overall advancement of the "state of the art" of programming. At various seminars and symposia on computer programming, open, frank and public discussions have been held concerning newly formulated algorithms or refinements of existing algorithms, and the participants have sought to build upon and improve the overall level of knowledge in the programming field. However, if patent protection for computer programs is permitted merely by the semantic innovations allowed by the Lower Court in this case, more restrictive and in-

[18] "Towards the Computer Utility: Evolution or Revolution," *Datamation* 125 (October 1969).

[19] *See Expanding Use of Computers in the 70's, Markets-Needs-Technology*, 54-55 (Prentice Hall 1971).

hibiting information handling practices will be inevitable. In fact, certain professional journals have already taken the position that they will no longer publish allegedly novel algorithms if the person who develops them claims patent protection.[20]

Another significant consideration is that the programming industry is quite different from other industries in which patent laws have wide application. One of its unique characteristics is that almost all of the end users of programs are also creators and duplicators of programs.[21] Although there are thousands of computer systems in this country, these systems service millions of users. Many of these user organizations have large staffs of programmers who spend full time preparing new algorithms or sets of instructions for programs, and these same users characteristically spend more for computer programming services than they pay for use of the computer.

In permitting the originator of an algorithm to obtain patent protection simply by drafting "machine system" claims, the Lower Court has imposed substantial practical impediments upon all users of computers. Users will be forced to assume a major responsibility for determining potential infringement claims arising out of computer applications programs they intend to use. They will be burdened with the need to spend substantial time

[20] The Association of Computer Machinery ("ACM") has taken this position with respect to its monthly publication known as the *Communications of the ACM*. The membership of this association includes many professional computer programmers who rely upon and look to such professional journals for maintaining and improving their general knowledge concerning developments in the programming field.

[21] It is the user of a computer who often devises the applications programs, *i.e.*, the programs which adapt the computer and a general systems program to his specific uses.

and money in right-to-use searches each time a different algorithm is to be programmed on an existing computer. Some may even employ secret methods of handling computer programming information in order to prevent others from ascertaining that they may have infringed an existing patent. Adversely held patents based upon computer programs will be a constant threat to the unrestricted use of computers.

These problems are magnified in the instant case where the algorithm utilized in respondent's financial banking procedure may also be used for manipulating data in other, unrelated, areas of business and technology. This result stems from the fact that a computer is a tool which may be thought to operate on abstract ideas. For example, when performing the computations for Einstein's formula $E=MC^2$, which demonstrates the relationship between matter and energy, the computer is performing the same steps as in calculating $A=\pi r^2$, the area of a circle. If patentability depends upon the generalization of computer operations common to both equations, the effect is to patent an abstract principle unlimited to specific applications. In the instant case, respondent's claims could be construed as not specifically limited to financial banking. Thus, if respondent's claims are held to be patentable by this Court, prospective users of respondent's algorithm in other unrelated areas of endeavor could be subject to a charge of infringement.

A patent may be infringed without knowledge of the patent or intent to infringe. If computer programs were patentable either directly or indirectly as a "machine system," each user of a computer would proceed at his peril in employing the computer for his particular application. He would never know whether the algorithms in his program were specifically covered by an existing patent or were the equivalent of a claim in a patented program. Such users could be confronted with the real pos-

sibility that use of a particular algorithm would involve them in infringement litigation unless they were to pay royalties claimed by holders of patents covering allegedly comparable programs.

It is not a practical answer to say that each user could make a search to determine whether his proposed program infringed an existing patent. There is not now —and there does not appear to be in the future—any feasible way in which such searches could be made. Nor can the burden be assumed by, or shifted to, suppliers of computers who do not have responsibility for, or often even knowledge of, the precise programs employed by users of their computers.[22]

2. *Programmed General Purpose Computers Are Important To All Phases Of Human Endeavor*

Increased computer utilization stimulated, in part, by the free and open exchange of computer programs, has contributed to a substantial upgrading of the quality of life for every American. The computer has become the "engine" which assists in running our society[23] and will be able to assist man in numerous areas totally unrelated to the usual business applications for computers today.[24]

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[22] This Court recently was confronted with an analogous problem in connection with copyright infringement. In *Twentieth Century Music Corp.* v. *Aiken*, 43 U.S.L.W. 4799 (June 17, 1975), the Court held that copyright laws did not prevent the proprietor of a restaurant from freely playing his radio for the enjoyment of patrons. In reaching this conclusion the Court observed:

> First, a person in Aiken's position would have no sure way of protecting himself from copyright infringement except by keeping his radio set turned off. *Id.* at 4802.

[23] Binger, The Computer: Engine of the Eighties, *Advanced Management Journal* (January 1967).

[24] Among the many articles discussing the revolutionary impact computers will have on our society are the following: F. G. Withington, "Beyond 1984: A Technology Forecast," *Datamation*, Vol. 21, No. 1, Jan. 1975); Bjerrum, "Forecast of Computer Develop-

Some typical examples of computer uses and applications which have occurred and can occur in the next few years include the following:

Health Care

Computers are monitoring instruments and sensors in intensive care units and give an instantaneous current report of the condition of each patient in a hospital. Computers also record and analyze laboratory tests and maintain accurate medical records on all patients. They are serving communication and information links among various hospitals and individual doctors' offices and clinics, and are beginning to provide current information on many developments in the medical field. Computers are presently being utilized in assisting medical research in searching for cancer cures.[25]

Education

Computer-aided training and instruction techniques are moving from research to implementation making high quality education available to more children on an equal basis. Computers will be heavily responsible for enabling everyone, regardless of economic status, to have the advantages of higher learning. In addition, computers are being used increasingly in the world's great research

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ments and Applications 1968-2000," *Futures*, June 1969; Martino, "What Computers May Do Tomorrow," *The Futurist*, October 1969; Hammer, "Electronic Systems of Today and Tomorrow," Paper for State Department Seminar, June 1969; "What Comes Next in the Computer Age," *U.S. News & World Report*, June 1967; Diebold, "The New World Coming," *Saturday Review*, July 23, 1966; Ware, "Future Computer Technology and its Impact," *The Rand Corporation*, March 1966.

[25] McCarn and Moriarty, "Computers in Medicine," *Hospitals* J.A.H.A., January 1, 1971; "The Computer in Medicine," *Am. News*, March 2, 1970; Reilly, "Computers in Medicine," *Datamation*, May 1969.

libraries to cope with the exploding growth of recorded knowledge.[26]

Science and Engineering

Computers will continue to contribute possible further advances in science and engineering. They have already made possible this country's exploration of other planets and the Apollo Program to put a man on the moon. Scientists perform complex mathematical computations with computers and through them, have available large libraries of data for rigorous analysis. Further, utilization of computers will make possible a pushback in the frontiers of mathematics, chemistry, physics and engineering to an extent difficult to comprehend by present standards. Just one example is the search for new energy sources, which will be aided greatly by computers.

Government

Computers present unique opportunities for Government to be more effective and helpful to the average citizen. With the aid of computer programming techniques, a given problem such as pollution control or urban planning, can be simulated in terms of a mathematical model. This model can then be entered into the computer and the data manipulated to simulate actual results from the application of a proposed solution.

Legal

There are also tremendous potentials for computers to assist in relieving the nation's crowded court dockets, to collect and analyze legal documents and precedents, and to achieve better overall administration of the rapidly

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[26] *See* Computers in Higher Education, Report of the President's Science Advisory Committee, February 1967; Hansen, "Computers in Education," *The Clearing House*, December 1970, Vol. 45, No. 4, p. 195.

increasing workload of the police and law enforcement agencies.

In the case of judges and lawyers, computers are being used increasingly to assist in legal research freeing additional time for analysis. Computers also furnish invaluable assistance in collecting, summarizing and cataloging much of the factual data involved in complex litigation and other areas of the law.

Individual

It is reasonable to expect that computers will continue to present unique opportunities for the average individual in his everyday activities. In the home, computers will assist in performing such functions as food procurement, climate and lighting control as well as other home management functions. Also, computers will make it possible for individuals to obtain information needed on many subjects through point-to-point communication with a central computer or small individually-owned computers. Inexpensive electronic hand-held calculators, some of which are programmable, are already in widespread use. In a few years, computer terminals or communication devices will be just as common in homes as telephones or television sets.

3. *Because Many Countries Do Not Grant Patents On Computer Programs There May Be An Adverse Financial Impact Upon The United States Unless The Lower Court's Decision Is Reversed*

At present, many countries in Western Europe prohibit the granting of patents on computer programs. For example, in France, a statute was enacted which specifically prohibits patent protection for computer programs.[27]

[27] Article 7 of the French Patent Law of January 2, 1968. An English translation appears in Industrial Property 67-75 (BIRPI, Geneva, Switz., March 1968).

Similarly, in Germany,[28] the Netherlands,[29] and Switzerland,[30] there have been court decisions declaring computer programs to be ineligible for patents. The United Kingdom's Government has appointed a committee to examine the patent system. That committee recommended that patent protection not be available for computer programs,[31] and this recommendation has recently been reaffirmed by the British Government.[32]

Since several countries in Western Europe have decided not to extend patent protection to computer software, a serious international legal and balance of trade problem can result if the Lower Court's decision in this case is affirmed. In such case, someone in a foreign country could easily use or copy a program on which a patent has been issued in this country and have total immunity from any infringement claims under our law. Because of the availability of instantaneous communication between Western Europe and the United States, it would then be possible to use the patented program in Europe and communicate the result directly to a com-

[28] The Federal Patent Court of Germany handed down two decisions on July 23, 1974 and one decision on August 6, 1974, against computer program patenting.

[29] A decision of the Patent Office Board of Appeals on December 16, 1970, held that computer programs are not patentable under the Netherlands Patent Act, BIE No. 2, February 15, 1971.

[30] Computer programming inventions are currently considered unpatentable in Switzerland as the result of a Swiss Patent Office decision of September 3, 1968. Patent Master Und Markenblatt 68-1-53.

[31] The British Patent System. Report of the Committee to Examine the Patent System and Patent Law, Cmnd. No. 4407, at 144 (July 1970).

[32] Presented to Parliament by the Secretary of State for Trade by Command of Her Majesty (April 1975). Item 12 on page 4 includes the following statement: ". . . . There will also be a non-exhaustive list of exclusions from patentability . . . . (which) will include, amongst other things, computer programs . . . .".

puter located in the United States. Under these circumstances, the domestic patent would be rendered virtually ineffective, and the chief result would be a negative impact on our domestic economy. Among other things, such result would constitute an unfortunate and avoidable violation of United States employment and trade policy.

C. Whether Claimed As A Process Or Machine System, The Nature Of Computer Programs As A Method Of Doing Business Render Them Ineligible For Patent Protection Under The Constitution And The Patent Code

As noted in Section A, the Lower Court in this case held that a computer program may be patented under the applicable sections of the Patent Code, Title 35, U.S.C.,[33] if claimed as a "machine system". Not only does this holding conflict with this Court's decision in *Gottschalk* v. *Benson*, *supra*, but also the considered view of the United States Patent Office and the President's Commission on the Patent System.[34]

As previously explained, a computer program is a set of operating instructions for a computer and implements an algorithm which, for example, may be mathematical or a method of doing business. The significance of the instant case is that it makes possible the patenting of a "machine system" claim covering an algorithm for a method of doing business, regardless of the type of general purpose computer used for implementation. The result of the Lower Court's view makes only the form of the claim important, not the substance of what is being claimed. The effect of that decision is to provide

[33] The relevant statutory provisions are contained in Sections 101 and 102 of the Patent Code, Title 35, U.S.C.

[34] *See* "To Promote the Progress of Useful Arts," The 1966 Report of the President's Commission on the Patent System (reprinted in S. Doc. No. 5, 90th Cong., 1st Sess. p. 21).

patent protection to abstract ideas, scientific principles, and the like, as well as methods of doing business. Such result is inconsistent with this Court's holding in *Gottschalk* v. *Benson*.[35]

The relevant clause in the Constitution which governs the granting of patents is contained in Article I, Section 8, Clause 8 which provides:

> The Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

The focus of the patent clause (and the statutes implementing that clause) is on "progress," and Congress is granted only a "qualified authority . . . limited to the promotion of advances in [science and] the useful arts." *Graham* v. *John Deere Co.*, 383 U.S. 1, 5 (1966). Because [t]he patent system must promote . . . progress," *Graham*, *supra*, "[p]atents cannot be sustained when . . . their effect is to substract from former resources freely available to skilled artisans," *Great A & P Tea Co.* v. *Supermarket Equipment Corp.*, 340 U.S. 147, 152 (1950).[36]

[35] *See* 409 U.S. at 71 where the Court said: "It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula . . . were patented in this case."

[36] As this Court declared in *Precision Instrument Mfg. Co.* v. *Automotive Maintenance Mach. Co.*, 324 U.S. 806, 816 (1945):

> A patent by its very nature is affected with a public interest. As recognized by the Constitution, it is a special privilege designed to serve the public purpose of promoting the 'Progress of Science and Useful Arts.' At the same time, a patent is an exception to the general rule against monopolies and to the right to access to a free and open market. The far reaching social and economic consequences of a patent, therefore, give the public a paramount interest in seeing that patent monopolies . . . are kept within their legitimate scope.

Among such resources are the scientific principles, mental processes, methods of doing business and abstract intellectual concepts which are the basic instruments of business, science and technological development. The free interchange of such information cannot be restricted by patents. As Chief Judge Garret observed in *In re Abrams*, 188 F.2d 165, 168 (C.C.P.A. 1951):

> Citation of authority in support of the principle that claims to mental concepts which constitute the very substance of an alleged invention are not patentable is unnecessary. It is self-evident that thought is not patentable.[37]

The algorithms which are sought to be patented in this case are based on rules of logic which are more like thought and mathematical principles than anything else. They should be treated in the same manner as the algorithms in *Gottschalk* v. *Benson*.

The U.S. Patent and Trademark Office recognizes that the form of claim does not change the character of the non-patentable subject matter sought to be patented. Thus, its guidelines issued in 1968 state that "computer programming per se, whether *defined in the form of a process or apparatus shall not be patentable.*" [38] In keeping with this view, the Patent and Trademark Office

[37] *Also see* the passages from the letters of Thomas Jefferson, the first administrator of our patent system, quoted in *Graham* v. *John Deere Co.*, 383 U.S. at p. 8, n.2.

[38] Patent Office Guidelines to Examination of Application for Patents on Computer Programs, 22 Fed. Reg. 15609 (1968); emphasis added. These guidelines were suspended only after the Lower Court issued a series of decisions, which in effect held that computer programs were patentable as a "process" under the patent laws. *See, In re Prater*, 415 F.2d 1378 (C.C.P.A. 1968), *mod on reh* 415 F.2d 1393 (C.C.P.A. 1969); *In re Bernhart*, 417 F.2d 1395 (C.C.P.A. 1969); *In re Musgrave*, 431 F.2d 883 (C.C.P.A. 1970); *In re Mahoney*, 421 F.2d 742 (C.C.P.A. 1970); *In re Foster*, 438 F.2d 1011 (C.C.P.A. 1971); *In re McIlroy*, 442 F.2d 1397 (C.C.P.A. 1971).

Board of Appeals in this case refused to allow the machine claims on the ground that non-patentable subject matter was being claimed, regardless of the form of the claim.

The claims involved in this case essentially deal with a method of doing business—a procedure for manipulating data to give an informational result—and the mere fact that a computer is used as a tool for implementing the algorithm involved in the financial banking system sought to be patented does not convert a method of doing business, or the logical principles upon which it is based, into a "patentable machine." The Lower Court's decision has misconstrued the applicable statutory provision in extending patent protection to algorithms in this fashion.

D. The Copyright Laws Provide A Viable Form Of Protection For Marketing Computer Programs

This Court in *Gottschalk* v. *Benson* observed that if proprietary protection under federal statute is considered necessary for computer programs, it should be accomplished through legislation and not through a distortion of the patent laws.[39]

In this connection the copyrighting of computer programs is becoming established as an acceptable form of protection. In 1964, the Copyright Office determined that computer programs can be registered under the copyright laws if certain requirements are met.[40] Since the an-

[39] 409 U.S. at 73. "If these programs are to be patentable, considerable problems are raised which only committees of Congress can manage, for broad powers of investigation are needed, including hearings which canvass the wide variety of views which those operating in this field entertain. The technological problems tendered in the many briefs before us indicate to us that considerable action by Congress is needed."

[40] *See* U.S. Copyright Office Announcement SML-47 (May 19, 1964). Three conditions which software must meet for copyright protection are: (1) original authorship; (2) publication of copies in

nouncement, over a thousand such programs have been registered with the Copyright Office. Of course, the existence of copyright protection does not prevent someone from individually arriving at the same result through his own efforts, and a copyright can only protect the form of expression used in a particular program.[41] Experience has shown, however, that the copyright law is a viable form of protection in marketing computer programs.

In preliminary work on copyright revision, committees of Congress have explicitly recognized copyright protection for computer programs.[42] Congress has also seen fit to enact into copyright legislation provisions for a Commission to study copyright protection in connection with new technology including computer programs.[43] This Commission will study reproduction and use of copyrighted works of authorship and recommend procedures for access as well as recognition of the rights of copyright owners.

The consensus of non-governmental experts attending a recent meeting of the World Intellectual Property Organization (WIPO), at which computer program pro-

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a form perceptible or capable of being perceptible to the human eye; (3) depositing copies for registration to consist of or include reproductions in a language intelligible to human beings.

[41] "The Uneasy Case for Copyright: A Study of Copyright In Books, Photocopies and Computer Programs," 84 Harv. L. Rev. 344, n.247 (1970); "Copyright Protection for Computer Programs," 64 Colum. L. Rev. 1274 (1964); "Scope of Protection for Computer Programs Under The Copyright Act," 14 DePaul L. Rev. 360 (1964); "Computers, The Copyright Law And Its Revision," 20 U. Fla. L. Rev. 386 (1968); Cary, "Copyright Registration and Computer Programs," 11 Bull. Copyright Soc'y 361 (1964).

[42] Senate Judiciary Committee Report on Copyright Law Revision, 93-983 dated July 3, 1974, page 104.

[43] Public Law 93-573, December 1974, "To Establish A National Commission On New Technological Uses Of Copyrighted Works And For Other Purposes."

tection discussions were conducted, was that there should be a new type of legal protection for computer programs which would resemble copyright but would be particularly tailored to suit computer software protection.[44]

V

CONCLUSION

For the foregoing reasons, we respectfully submit that the computer program sought to be patented by respondent Johnston in this case should not be eligible for patent protection and that the Lower Court's decision should be reversed.

Respectfully submitted,

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[44] June 23-27, 1975 World Intellectual Property Organization (WIPO) meeting in Geneva, Switzerland of the Advisory Group of Non-governmental Experts on the Protection of Computer Programs, Report AGCP/NGO/II/10.